

USE OF DISTRIBUTED COMPUTER SYSTEMS FOR HARDWARE AND SOFTWARE VIRTUALIZATION

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Historically, in large cities, the computer networks of any stably existing enterprises, organizations of various profiles were built according to the financing and improvement of the possibilities of purchasing computer equipment. The practice of introducing new technologies preceded scientific and technical substantiation, evaluation of the effectiveness of project solutions and generalization of the results that were achieved.

Gradually, such networks were transformed from simple computing complexes to interconnected systems of the corporate level, which have such computer reserves that provide solutions for current tasks of conversion and presentation of necessary information to users. Consider the conceptual rationale for obtaining additional computer resources for the development of the transport infrastructure of a large city or region due to access to such computer systems. Any computer resources of organizations and enterprises that are developing stably have trends in the development of computer resources. In their computing environment, the ability to coordinate the use of heterogeneous distributed resources relies on GRID technologies, as the simplest implementations of Cloud Computing. They provide opportunities to use various resources: computing, data storage, and communication. It should be noted that the reliability and performance of individual systems may be relatively small, but the user of such a distributed system receives a single reliable and productive platform for computing, gaining access to databases and knowledge, and can also store his data and use various communication technologies. The development of the topology of computer networks practically goes through three levels: Intragrid (internal GRID) → Extragrid (external GRID that unites several organizations) → Intergrid (global systems that unite many organizations, partners, cluster solutions). It is this GRID level that should be responsible for the development of the transport infrastructure of a large city or region. Usually, such unification is coordinated by the GRID system, and the corresponding virtual network allows to technically combine disparate internal networks and clusters into a single information space, which is coordinated by a single GRID technology, which is provided to the user in the form of a single virtual platform. The corresponding topology at the lower level is a separate computing laboratory in which the user applies the virtual computer mechanism and has access to Intergrid resources.

A kind of immersion of the automated workplaces of a separate transport WEB laboratory, the information department of the enterprise into the computerized space

of separate systems existing in the big city, which have Intergrid resources, allows you to get a significant profit from the use of additional computer resources involved in this way.

In the environment of GRID technologies, from a practical point of view, the Instant-GRID distribution (<http://www.Instant-grid.org>) will be the most convenient and multifunctional. It is based on the Knoppix system (Live-CD) and the Globus Toolkit system (middleware that provides the ability to use GRID technologies). The Instant-grid system has a convenient user interface, which is based on the use of web browser data presentation technologies. This system combines both console-mode applications and graphical applications. Many Globus Toolkit solutions are implemented in the distribution, for example: a WS-GRAM component for managing tasks solved in the system, a GRIDFTP system for file sharing, and a system for remote access to client machines over a secure channel. The development of heterogeneous computer resources involves the principle of competition, which ensures the "survival" of the most effective connections according to the property of self-organization.

The main requirement for the introduction of the latest technologies is to ensure the integrity of the software complex, which ensures the performance of scientific calculations, modeling and processing of experimental data. In this complex, the computer network of the transport organization is a unified software and hardware environment in which software modules are executed in parallel: office applications, Internet software, systems for automating design, modeling and special software complexes. However, after a more thorough analysis of many problems that are solved both in the transport organization and in any industry, it is necessary to make a statement about the large volumes of computer load of the channels, first of all, connections with the Internet.

References

1. Alekseyev, O., Alekseyev, V., Klets, D., Artiomov, M., Kurenko, A., Rohozin, I., Novichonok, S., Khabarov, V., & Kruk, B. (2017). Development of automotive computer systems based on the virtualization of transportation processes management. *Eastern-European Journal of Enterprise Technologies*, 6(3 (90)), C. 14–25. <https://doi.org/10.15587/1729-4061.2017.116351>